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## THE PLACE OF ABSTINENCE IN THE THEORY OF INTEREST.

RECENT discussions have reduced the theory of value to an equilibrium between marginal cost, on the one hand, and marginal utility, on the other. Nothing is more fundamental in economic science than that the two elements of cost and utility are both necessary to the existence of value. So much has uniformly been held since the beginnings of Political Economy. The special service of the marginal utility theory has been to point out the way in which these two factors co-operate to fix value. By reducing to a common subjective basis those two unlike things which older economists had tried to balance against each other,—namely, demand and supply,—this new theory has done much to give harmony and logical consistency to economic science. Value, however, is not the only economic phenomenon to which the time-honored law of demand and supply has been applied. Interest and wages are so intimately connected with the conception of value that they are of necessity affected by the same principles which determine value. To these questions the law of demand and supply has been applied as rigorously as to the question of value. Nothing would be more readily admitted by all economists than that, if capital increases and the demand for capital decreases, the rate of interest will fall, and *vice versa*.

It is not so generally admitted in the case of interest, however, that the demand and supply are themselves regulated by the same principles which regulate them in the case of value. According to the new theory of value, if the desire for a commodity remains the same, but the production of it, through mechanical improvements or for

other reasons, becomes cheaper, the supply will increase until the marginal utility of the commodity is reduced to a level with the marginal cost or disutility of its production.\* If, on the other hand, the conditions of production remain unchanged, and, through the acquisition of a higher standard of life, the desire for the commodity increases (which means that a given quantity of the commodity satisfies a more pressing want than before), the marginal utility will be raised and production will increase until the increased marginal cost again balances the marginal utility. The value of a commodity according to this theory is simply its marginal or effective utility.

To have a correct understanding of the nature of interest, we must first get a clear understanding of the nature and function of capital. Especially must we have a clear conception of the distinction between capital and wealth. It is doubtful if any improvement can be made upon the classical conception of capital as that portion of produced goods *saved* to be devoted to purposes of further *production*.† This, so far as the question of interest is concerned, is all that is implied in the term. Capital, according to this definition, is produced by an act of saving. In other words, portions of the general fund of wealth only fall into the category of capital by having their consumption deferred, in order that they may assist in producing more wealth.

When we speak of the cost of production of consumption goods, we mean the disutility or sacrifice involved in bringing them into shape for consumption. This disutility is measured by value, or, if we seek a money measurement, by price. But with capital goods a new element enters into the cost of production; namely, the disutility of abstinence. While, as general economic goods, they have their price to compensate for their cost of production, yet,

\*This, of course, supposes competition.

†That is, production from the individual standpoint.

as capital goods, interest serves to compensate for the sacrifice of deferring their consumption till the future. When we speak of the utility of consumption goods, we mean their capacity to satisfy wants. But the distinctive utility of capital goods is to increase the quantity of consumption goods. Interest likewise measures this distinctive utility of capital goods, just as exchange value expresses the general effective utility of consumption goods. The cost of production of capital, as distinguished from wealth, is, therefore, abstinence; and its utility is its productivity, or the surplus of want-satisfying power which its possession affords above its cost. If we keep the distinct conception of capital as the result of saving, we shall have no difficulty in seeing that its distinctive cost of production is whatever sacrifice is involved in the act of saving, and that its distinctive utility is its ability to produce a surplus. We may observe that the amount of disutility of saving depends largely upon the cost of production of consumption goods. Where industrial processes are unadvanced, and the disutility of producing consumption goods is great, such goods are likely to have a high marginal utility, and it will cost a high degree of sacrifice to abstain from the consumption of goods which supply such pressing wants. Or, looking at it from another standpoint, it will cost a high degree of sacrifice to turn part of the productive force from the production of things for consumption to the production of things to be used in further production. Where present wants are pressing, it costs a high degree of sacrifice to defer their satisfaction to the future. If, on the other hand, industrial methods are advanced, if production is cheap, and if marginal utilities are low, present wants will not be pressing, and a certain amount of saving can take place with little or no sacrifice.

Walker's primeval fisherman (*Political Economy*, third edition, chap. iii.) would endure a much greater degree of abstinence while making his canoe if fish were scarce

than if they were abundant. If fish were scarce, it might require all his time to catch enough to supply his daily needs. Under such circumstances it would cost him a severe privation to spend a part of his time in making himself a canoe. In order to induce him to do so, he would have to be assured of a considerable increase in his catch by means of the boat. In other words, he would not undergo the present heavy sacrifice to produce capital unless his capital were highly productive. But, if fish were so abundant that he could supply his present wants tolerably well by working only half his time, he would probably take time to make a canoe for the sake of a much smaller proportional addition to his catch.

Interest, as we hope to show, is the price that measures the marginal productivity, on the one hand, and the marginal cost or sacrifice, on the other. It ought to be clear that, were either the elements of cost or productivity lacking, interest would be as impossible as value with either cost or utility missing; but it is not clear to some. But, meanwhile, it must not be forgotten that it is only marginal productivity and sacrifice in the one case and marginal utility and cost in the other that determine either interest or value.

Many of the writers on interest who have gone below simple demand and supply may be put into one of two general classes: 1. Those who hold that interest is paid because capital is productive; 2. Those who hold that it is payment for abstinence or the sacrifice of saving. When we read the arguments of the one class, we cannot see but that they are right. When we undertake to find fault with the arguments of the second class, we find it a difficult matter to point out their fallacy. The conclusion almost forces itself upon us that both are right. Under such circumstances we shall do well to ask if there is any real contradiction between them. We shall probably find that both theories are in part true, and, moreover, that

each is an essential part of the other; that neither can account for interest without the help of the other.

Professor Böhm-Bawerk's theory of interest, while ostensibly an attempt to reduce the whole interest problem to the one element of abstinence, or the discounting of the future, really contains the productivity theory under a new form.\* In his theory of the profits arising from an extension of the productive process † we can scarcely fail to recognize the old productivity theory under a new form. Nevertheless, the attempt to reduce the productivity of capital to the same terms with abstinence, by showing that both result from the fact that men discount the future, is to be admired both for its suggestiveness and its profundity. With certain corrections, which will be noticed later, his theory may be regarded as correct; but it is to be hoped that the interest problem can be explained upon principles more easily understood by the average reader.

Under "naïve productivity theories of interest" Böhm-Bawerk naïvely suggests ‡ that the theory that capital produces a surplus value rests upon the mere empirical observation that the employment of capital is followed by a surplus value, and that this fact does not necessarily prove that the employment of capital is the *cause* of the surplus value. Without going into a metaphysical discussion of the relations of cause to effect, may we not venture to suggest that, for economic purposes, the fact that a surplus value does follow the use of capital amounts to precisely the same thing as though the capital were, in an unequivocal sense, the cause of the surplus value? To the borrowing classes the fact that the possession of capital affords them a surplus value furnishes the same motive as though the capital could, in a biological sense, reproduce

\*See F. A. Walker, "Dr. Böhm-Bawerk's Theory of Interest," *Quarterly Journal of Economics*, July, 1892.

† *Positive Theory of Capital*, Book VI. chap. iv.

‡ *Capital and Interest* [Smart's translation], p. 133.

its kind. What they want is this surplus value: it is immaterial to them whether it follows as a result of, or as an incident to, the employment of capital. So long as the acquisition of this surplus value is conditioned upon the possession or control of capital, interest will be paid. By admitting that a surplus value follows the employment of capital, all is admitted that those who hold to the productivity theory will be disposed to claim.

But, while men are willing to pay interest for capital to assist them in securing a surplus value, it is only for a limited amount. The operation of the law of diminishing marginal productivity limits the amount of capital which any individual can afford to employ at a given price. The same is true of all those engaged in the production of any given commodity. The tendency is to increase production until the diminished price of the commodity is just sufficient to pay the costs of the last increment. Since interest is a part of the cost of production, it follows necessarily that the amount of capital employed at a given rate of interest must be limited, and that the limit having been reached, other things remaining the same, if more capital were brought into that occupation, interest must fall, because the productivity of the added increments is less than that of the preceding. What takes place in an individual industry may be applied to industrial society in general. We therefore come to the conclusion that an essential part of the productivity theory is the idea of marginal productivity,—an idea so well developed by Professor Clark.\* If the rate of interest throughout the entire industrial field cannot rise permanently above the productivity of the last increment of capital, and if the marginal productivity of successive increments of capital tends at any given time to decrease, it follows that, other things remaining the same, an increase of capital will

\* "Capital and its Earnings," *Publications of the American Economic Association*, 1888.

be accompanied by a fall in the rate of interest, and *vice versa*.

We now come to the difficulty that confronts us in attempting to account for interest on the productivity theory alone. It follows from the foregoing conclusions that, if capital were to increase in an unlimited measure, marginal productivity would be destroyed. If, as indicated above, the rate of interest cannot rise above the productivity of the last increment of capital seeking employment, and if the productivity of successive increments of capital, under given conditions, continually decreases, it follows that, if a sufficient number of increments are put on the market, marginal productivity will finally reach the zero point, and no interest will be paid. It is conceivable that there might be a society with such a superabundance of capital that no more could be profitably employed at any price. Under such conditions there could be no true interest. Whatever might in individual cases be paid by the borrower of consumption goods would be payment for risk, and partake of the nature of insurance. Now, what is it that keeps capital from accumulating in such abundance? *Were there no sacrifice to balance the advantage accruing from the receipt of interest, would not capital accumulate, and be offered on the market even at the lowest conceivable rate of interest?* If it is a matter of complete indifference to me whether I consume a certain amount of my wealth to-day or next year, I shall surely save it till next year, if meanwhile I can either employ it profitably myself for purposes of further production or lend it at interest to some one else who can.

Some confusion has previously arisen by restricting the term "interest" to that which is actually paid from one man to another for the use of capital. This view overlooks the fact that interest forms an element of cost when the entrepreneur owns his own capital, just as when he hires it of some one else. In view of this fact, we may avoid con-

fusion if we agree, for the purposes of this discussion, to use the term "interest" as synonymous with the profit, or objective surplus, arising from the employment of the last increment of capital. It is only in this sense that interest can be said to enter into cost of production. If this is borne in mind, it will save us the confusion that might otherwise result from the apparent shifting from one standpoint to the other during the remainder of this paper.

It must be borne in mind that not all saving involves sacrifice. There would be some saving, were there no interest or objective surplus arising from the employment of capital. It is even probable that a considerable amount would be saved if, instead of savings affording a surplus, men were obliged to pay rent for vaults in which to store them or even to hire others to take their surplus wealth and use it for them. In so far as it is true that men estimate present higher than future consumption, it only applies to the consumption of corresponding increments of income. A man with an income of ten thousand dollars a year derives less utility from the consumption of the last than from the first thousand. He may receive so small an amount of pleasure from the consumption of the last thousand dollars that he will prefer to save it for the purpose of satisfying a more pressing want in the future.\* It is upon this principle that men lay up for a rainy day or for old age. This may be illustrated by the diagram on the following page.

In Figures I. and II. let the amount of a man's income be measured along the horizontal lines A B and A' B'. Let the utility of different increments be represented by the perpendicular lines, those in Figure I. representing the present utility of present increments of goods, while those in Figure II. represent the estimate which we now put upon the utility of the same or equivalent increments of

\*For this, as for several other suggestions, I am indebted to Professor J. B. Clark's lectures at Johns Hopkins University in the fall of 1892.

goods a year hence. In other words, we discount the future at a rate corresponding to the ratio between the perpendicular lines in Figure I. and the corresponding lines in Figure II. It is evident, then, from the diagram that increment No. 10 would be saved, in order that it might be applied to the satisfaction of want No. 1 in the future. Similarly, No. 9 of the present would be saved because No. 2 of the future is higher. The same may be said of No. 8 of the present because it does not quite come up to No. 3 of the future. But here saving would stop; for there would be a loss in abstaining from the consumption of No. 7, in order to apply it to No. 4 in the future.

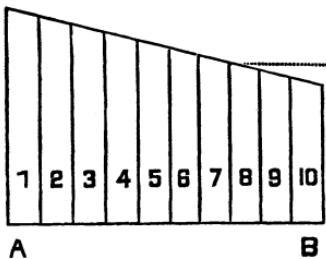


FIG. I.

PRESENT ESTIMATE OF PRESENT CONSUMPTION.

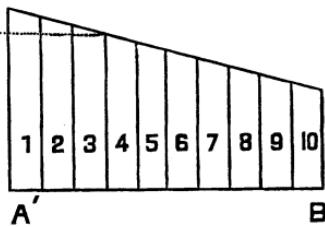


FIG. II.

PRESENT ESTIMATE OF FUTURE CONSUMPTION.

This diagram, it will be understood, only illustrates a certain social tendency. In a less advanced stage of society than that to which we are accustomed the difference between the estimations of present and future would be greater than under present conditions. Even in present society there are those to whom the future seems to offer small inducement for present frugality. On the other hand there are those in whom the instinct of saving is so strong that they seem to begrudge themselves present satisfaction, and that, too, without much thought of future consumption, but simply to gratify their desire for accumulation. But the normal tendency is probably illus-

trated by the man who looks forward to the time when he will have greater wants to supply on account of a growing family, or the hope of some time having a growing family to provide for, and who also looks forward to the time when age will begin to tell upon his powers, and the same income will have a larger marginal utility, owing to the increased pain of producing it. Neither in the case of this man, nor in that of the miser, is there any true sacrifice connected with saving. His capital costs him nothing; *i.e.*, it cost him nothing to transform a certain portion of his wealth into capital. That amount which a man would save, whether there were interest or not, is not saved at a cost. As capital, it is not produced at a cost, unless this cost be in the form of risk, which may be involved in its employment in production.

If only so much were needed to carry on industry,—*i.e.*, if so much were sufficient to bring down the marginal productivity to the point where it would just pay the capitalist for his risk,—there would be no true or net interest. But, if more is needed,—*i.e.*, if more can be used, and still afford profit at the margin,—it must be paid for, because to save it requires sacrifice from somebody.\* Returning to our illustration, if increment No. 7 is required, it will be saved at a loss, because its present utility stands higher than our present estimate of the utility of No. 4 in the future.

In this connection appears a possible correction to Böhm-Bawerk's theory, according to which interest must equal the amount by which men discount the future, or the difference between the value of present and of future goods. The statement that “present goods are, *as a rule*, worth more than future goods of like kind and number,”† would carry with it the statement that a dollar now is

\* See Marshall, *Principles of Economics*, first edition, vol. i. Book VIII. chap. vii. § 4.

† *Positive Theory of Capital* [Smart's translation], p. 237.

worth more in present estimation than a dollar a year hence. If we eliminate the element of risk, as he expressly states that we must do, it can scarcely be said to be true that, *as a rule*, a dollar is worth more to-day than a year hence.

Of the wealth in the possession of society to-day it is altogether probable that the greater part would be saved for more than a year, even if there were no objective surplus to be secured by so doing. In other words, so far as concrete goods are concerned, their future value is sometimes greater than their present, because they are expected to supply a more pressing want in the future than it is possible to apply them to in the present. In such cases there is a high reward for saving in the anticipated future increase in the subjective utility of the goods. This class of goods may be called the first increment of capital saved. It is that portion which would be saved even if its owners should be compelled to hire vaults, at an objective cost, in which to store it. The second increment may have a lower anticipated future increase of utility than the first; but its future utility may still be estimated just as highly as its present utility, while the saving of the third involves a positive sacrifice, because its future subjective utility is estimated as lower than its present, that of the fourth still lower. In this case, the decrease of subjective utility must be compensated for by an increase in objective goods. It is not the difference in the general estimation of present and future goods which fixes the rate of interest, but only the difference in the estimation of the present and future value of the last increment of goods saved.

If in Figure III. we let the angle of descent of the line A C'' represent the rate at which, according to Böhm-Bawerk, men discount the future, and let the line A B represent the present value of a commodity, the line C B' would represent our present estimate of its value a year

hence,  $C' B''$  its estimated value two years hence, and so on. According to this theory, one year's interest ought to equal the dotted line  $A' C$ , two years' interest the dotted line  $A'' C'$ , and so on.

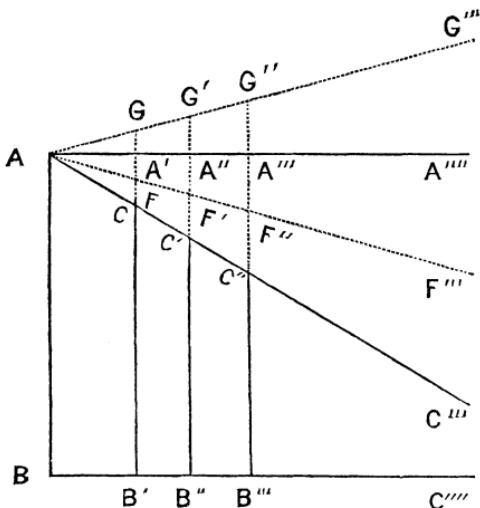


FIG. III.

In the first place, as suggested above, it is not correct to speak of a general discounting of the future use of commodities, or concrete goods. In a great many cases, the future use of a commodity is estimated higher than its present use, because present wants are so well supplied that the marginal utility of present consumption is very low. Suppose, for example, that you have one hundred dollars in your pocket. You can spend it all to-day on your dinner; and you might, could you forget the future, get some satisfaction out of the consumption of the last dollar. But you do not forget the future; and the amount of pleasure which you could get out of the expenditure of the last ninety-nine dollars and fifty cents is so small that you prefer to save it, in order that you may enjoy a series of ordinary dinners in the future. You would save it, were there no interest to be had. In fact, if you could

not keep it yourself, you would hire some one to keep it for you rather than consume it now. Yet, if you choose to lend it, you can get just as much interest for it as though it had cost you a heavy sacrifice to abstain from consuming it. Nevertheless, you doubtless have a more vivid appreciation of present than of future wants. There is a point at which you will stop saving, because you do not expect ever to be in a position when an ordinary dinner will be worth more to you than it is now. You will probably not forego the pleasure of a fifty-cent dinner and content yourself with a fifteen-cent lunch, in order to be better provided in the future, because you never expect to be in a position when you cannot afford a fifty-cent dinner. Were you a spendthrift, you would probably not hesitate to spend several dollars on expensive delicacies and fine cigars for the same reason. The spendthrift's appreciation of the future is very low. Your case may be taken as typical of society as a whole. There is a certain point where, were there no interest or profits from the use of capital, saving would cease. That point would be where men balanced present against future consumption ; in other words, where the subjective utility of present and of future goods is equal in present estimation. But if the use and employment of capital becomes productive, and the amount of capital in existence under these conditions were not enough to bring its marginal productivity down to the zero point, there would be a demand for more capital. In order to get it, interest in the form of an objective surplus would have to be paid to induce men to save more. This would be the case whether we assume a distinction between the capitalist and the entrepreneur, or that the entrepreneur is his own capitalist. In the latter case, the entrepreneur would count his abstinen-  
ce as a part of the disutility or cost of production, and would reward himself for it. Consequently, interest does not correspond to any general discounting of future con-

sumption of commodities, but only to the marginal discount or to the marginal sacrifice of saving. It must be sufficient to compensate the capitalist for saving the last increment of capital.

This also may be illustrated by Figure III. Of the first increment of goods saved, let the present value be represented by the line A B. The present estimate of its value a year hence by G B', two years hence G' B'', etc. Of the second increment, the present value is A B. The present estimate of its value a year hence is represented by A' B', two years hence by A'' B'', etc. Of the third increment saved, the present value is represented by A B, the present estimate of its value a year hence by F B', two years hence by F' B'', etc. Were this the last increment saved, one year's interest for all increments would correspond to A' F, two years' interest to A'' F', etc. But the fourth increment has a present value corresponding to A B, and an estimated value one year hence corresponding to C B', two years hence corresponding to C' B'', etc. Since this is the last increment saved, one year's interest throughout the field would correspond to A' C, two years' interest to A'' C', etc. The loss in the subjective valuation of this last increment must be compensated for by an increase in objective goods or interest. It is a characteristic of the market that interest tends to become equal throughout the field. All capital will therefore be paid for at the same rate as the most expensive increment. This affords a true surplus or rent,\* as will be noticed later.

If, however, it is intended to apply Böhm-Bawerk's theory to the difference with which we estimate present and future wants (as illustrated in Figures I. and II.), it is again found to be faulty. Men seldom abstain from the satisfaction of a want, in order to be able at some future time to supply the same or a corresponding want.

\* This is a common abuse of the word "rent," but there seems to be no better term.

In the case of those wants which we leave unsatisfied for the express purpose of getting interest, the interest does not pay for the difference with which we estimate the present and future satisfaction of the particular want which is forestalled. Let us return to Figures I. and II. If increment No. 7 were saved, the sacrifice would not correspond to the difference between No. 7 of Figure I. and No. 7 of Figure II., but to the difference between No. 7 of Figure I. and No. 4 of Figure II. If in Figure III. we let the descending line  $A\ C''$  represent the rate at which we discount future wants, the rate of interest would correspond to those portions of the perpendicular lines which lie above some such descending line as  $A\ F''$  rather than to those portions which lie above  $A\ C''$ .

As already stated, a considerable portion of the capital has involved no sacrifice in the act of saving. Were this supply sufficient to bring the marginal utility down to where it would just balance whatever risk the capitalist undergoes in lending or employing his capital, no true interest would be paid. A larger amount of saving would cut into more pressing wants, and involve a sacrifice. Men will not undergo this sacrifice unless they are paid for it. This gives rise to interest, which then becomes an element in the cost of production. As an element in the cost of production, interest would probably exist under a socialistic state. Whoever should abstain from consumption, in order that society might have the requisite capital to carry on the industrial process, would have to be compensated in some form or other. If society, as a whole, voluntarily set aside a certain portion for such purposes, society as a whole would bear the burden, and expect to be rewarded by an increased production. The only thing avoided would be the phenomenon of one individual paying interest to another. However, it is conceivable to the socialists that by the superior productiveness of the socialistic organization goods would become

so abundant that their saving would cost no sacrifice. It is likewise conceivable that such a state may yet be reached under the present system, though it remains an open question whether such a condition is to be desired. It might mean a number of different things, such as a lowering of the standard of living or a blocking of the wheels of industry from any number of different causes.

But abstinence is not the only sacrifice involved in the lending or the employment of capital. At present there is always more or less risk involved. Marginal productivity must be sufficient to compensate for both risk and marginal abstinence, for both are combined in the sacrifice of the capitalist class. For the present, therefore, we make no distinction between the interest paid and the surplus arising from the employment of the last increment of capital. Under static conditions they would be equal. Under present conditions so much the greater part of the capital upon which interest is paid is employed in production that the price is fixed by that portion. It controls the market just as the price of several commodities is fixed throughout this country by the price at Liverpool. The fact that interest is sometimes paid on consumption goods only indirectly affects the rate of interest. An increase in the amount borrowed for consumption, other things remaining the same, decreases the amount that can go into productive processes. This would raise the marginal productivity and the rate of interest, just as a sudden increase in the amount of pork or wheat consumed in this country decreases the amount that can go to Liverpool and raises the price there.

Perhaps a better idea of the place of abstinence in the theory of interest can be obtained if we use the diagram on page 56 as an illustration.

In Figure IV. let the amount of capital in the industrial community be measured along the horizontal line A C, and let the productivity of capital be measured along the

perpendicular line A E, and let the descending line E C represent the rate of decrease in the marginal productivity of capital. If the amount of capital were measured by A D, the marginal productivity and the rate of interest would be measured by A F. If the amount of capital were measured by A D', the marginal productivity would, other things remaining equal, be measured by the line A F'; and, when the amount of capital equalled A D'', marginal productivity would equal A F''. From this it follows inevitably that, if capital went on increasing to A C,

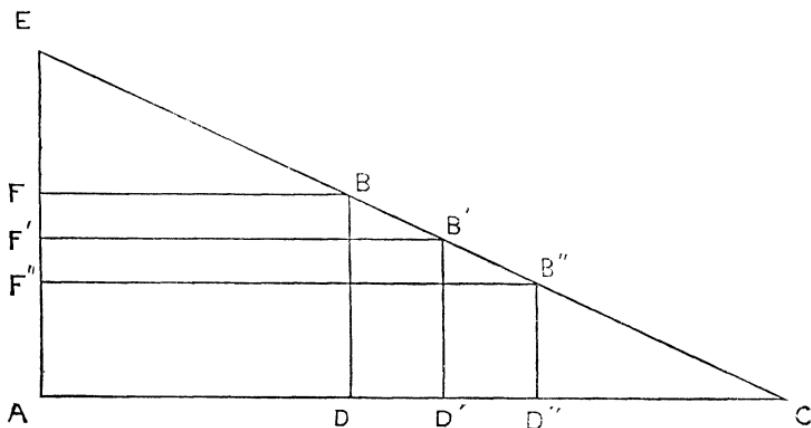


FIG. IV.

marginal productivity would be destroyed, and no interest would be paid. As above stated, were there no sacrifice connected with the accumulation of capital to offset the advantage accruing from the receipt of interest, capital would go on accumulating until the descending line E C approached indefinitely near to the line A C. But here the work of abstinence is seen in placing a limit upon the supply of capital before the point of no marginal returns is reached. Under static conditions saving will continue until abstinence plus the risk to the capitalist of saving the last increment is just balanced by the advantage de-

rived from the employment of the last increment of capital.

In Figure V. as in Figure IV. let the amount of capital be measured along the base line A C, and the productivity upon the perpendicular line E H, with the point A at zero, and let the descending line E C represent the rate of decrease in marginal productivity. Now let us also measure the cost or disutility of saving on the perpendicular line E H, with the point A as zero, and let the ascending line H G represent the rate of increase of marginal sac-

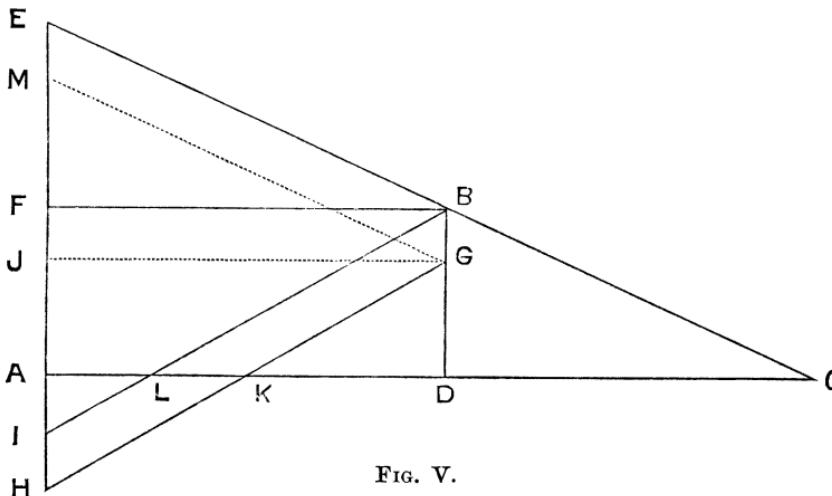


FIG. V.

rifice of abstinence. A quantity of capital equal to A K would be saved before any sacrifice at all were felt. But from this point the sacrifice increases until at point D the sacrifice of saving amounts to G D: net interest would therefore be measured by the line A J. Risk does not necessarily increase as saving advances, so the risk at the margin is measured by the line B G. Then total interest would be represented by the line B D or A F. It is when this total sacrifice of abstinence and risk equals the marginal productivity that saving will cease. In the illustration the capital in the industrial community repre-

sented would be measured by A D, marginal productivity and marginal sacrifice by B D, total interest by A F, net interest by A J.

It may, with a certain amount of justice, be objected that payment for risk is a part of the expense of the employer of capital, and must be subtracted from the product of capital, thus cutting down the marginal productivity of the capital to correspond to the line M G instead of being added to the sacrifice of abstinence. It would then be not a part of interest at all. Either view would be consistent; but, so long as so large a part of that which is actually paid under the name of interest is payment for risk, it seems better to include it as a part of the sacrifice of the capitalist, since it makes no real difference to the nature of the problem.\*

It can scarcely be denied that risk is a sacrifice to the capitalist. It is certainly one of the factors that influence the amount of saving. If men are doubtful of ever receiving a just return for their capital, they will have less inducement to forego the pleasure, however small, of present consumption. Men estimate present certain enjoyment considerably higher than future uncertain enjoyment. However, throughout the remainder of this paper, in order to simplify the illustrations, no distinction will be made between the sacrifice of abstinence and that of risk. Both will be treated under the general head of the total sacrifice of saving.

Any discussion as to whether marginal productivity or

\*At present we are compelled to take account of risk. It is to be hoped that the progress of economic science will soon make it necessary to deal with the question of risk under the separate heading of insurance. Of the traditional four channels of distribution, wages would undoubtedly have first impressed itself upon the mind of an economist. Such simple tools as the primitive workman used would scarcely have been regarded as of sufficient importance to call for a distinct treatment. The theory of interest, therefore, would have developed later than that of wages. Rent and profits followed each in its turn. Insurance will probably soon take its place as a fifth channel of distribution.

marginal sacrifice were the most important to the production of interest must be a waste of time, since both are necessary, and neither could account for interest without the help of the other. With a given rate of decrease in the productivity of successive increments of capital, whatever raises or lowers the amount of sacrifice involved in saving will correspondingly raise or lower the rate of interest by decreasing or by increasing the supply of capital. For convenience let us suppose that the rate of decrease of marginal productivity remains fixed. Then suppose that a series of poor crops or other adverse circumstances, by diminishing the income of society, increases the sacrifice of abstinence, or that rumors of war or domestic violence increases risk. Either case would result in a decrease of the supply of capital, and raise the marginal productivity and the rate of interest.

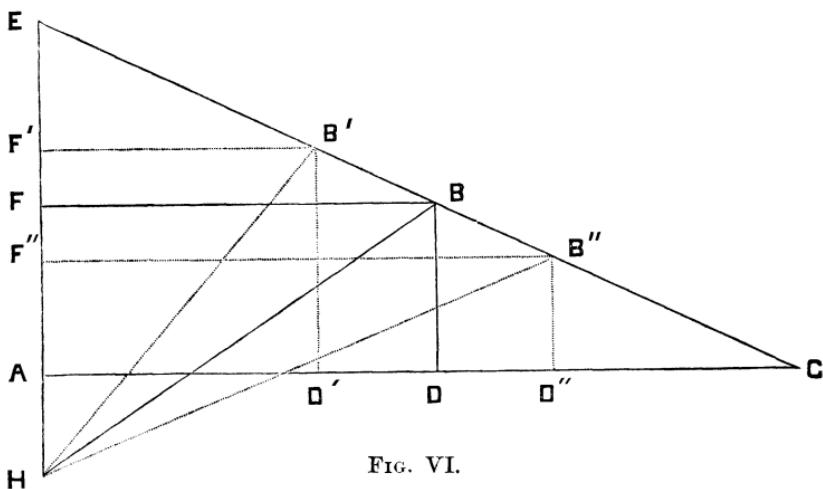


FIG. VI.

In Figure VI. as in Figure V., let **A D** represent the amount of capital, **A F** the rate of interest, the descending line **E B** the rate of decrease in marginal productivity, and the ascending line **H B** the rate of increase in marginal sacrifice. Now let us suppose the angle of descent of the line

E B to remain stationary: whatever increases the sacrifice of the capitalist classes will raise the line H B to the position of the dotted line H B'. The amount of capital will then be measured by A D', and the marginal utility and rate of interest by A F'. Or suppose the rate of sacrifice to decrease to correspond to the dotted line H B''. Then saving would go on to the point D'', and the rate of interest would be measured by the line A F''.

On the other hand, we may reverse the proposition by supposing the line H B to be stationary, while the line E B varies, and show that the same effect would follow the raising or lowering of E B. Thus we have the proposition: with a given rate of increase in the marginal sacrifice of saving and risking capital, whatever raises or lowers the productivity of capital correspondingly raises or lowers the rate of interest. The triangle H B F represents the rent or surplus gain of the capitalist.

It is impossible therefore to determine whether a high rate of interest is a favorable or an unfavorable sign until we know the reasons which make interest high. In a community where capital is safe and the payment of interest sure, where the people have a vivid appreciation of the future, where there are good natural resources, and population is not overcrowded, and where there has been no considerable destruction of capital by disasters, a rise in the rate of interest may pretty safely be counted as a favorable sign; for it probably indicates either that commercial and industrial conditions are favorable for the employment of more capital or that the people are acquiring a higher standard of life, so that abstinence costs them more than formerly. But, where any of the conditions are wanting, the conclusion does not follow.

From the standpoint of economic polities, it is probably best to lay more emphasis upon the cost or sacrifice element in the determination of the rate of interest. The factor of sacrifice is more easily corrected by social and

political measures. Education and enlightenment may increase the appreciation of the future, and encourage saving. Postal or other well-regulated savings-banks may do the same. Good legislation and a pure judiciary may decrease the risk of lending and employing capital; but it is not so easy to alter the productivity of capital.

If the foregoing argument is correct, it would seem that the productivity and the sacrifice theories of interest are to be harmonized in much the same manner as the cost and utility theories of value. This balancing of opposing forces which has been developed by Professors Jevons and Clark in relation to value seems capable of a much wider application than it has yet received. Its application to the theory of value is familiar to all. This paper is an attempt to apply it to the theory of interest, and it seems to the writer that the theory of wages might be made much clearer by an application of the same principle.

The question as to whether or not interest ought to be allowed by law resolves itself, as most other political questions, into the simple question of expediency. Without considering the question from the standpoint of abstract ethics, the argument from expediency is sufficient to justify interest. Were it possible to prohibit it, there would be at least two unfortunate results: First, much of the capital would be under inferior management. The reason A hires capital of B is because he can make better use of it than B can. He can make it produce more. If therefore B were forbidden to receive payment for the use of his capital, either society would lose through his inferior management or he would consume it. This brings us to the second unfortunate result. It would decrease the amount of saving. Capital to assist in carrying on industry would become scarcer, and society would suffer from a diminished supply of goods with a corresponding advance in cost.

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